IN THE CLAIMS:

1. (Currently Amended) A mass spectrometer adapted for underwater use comprising:

a watertight case having ~~an~~ a fluid sample inlet;

a fluid control system adapted to acquire a fluid sample from an aqueous environment for delivery into the watertight case, the fluid control system positioned within the watertight case and in fluid communication with the sample inlet;

means for transforming an analyte molecule in the fluid sample from a liquid ~~solution~~ phase into a gas phase positioned within the watertight case;

means for directing the ~~a~~ fluid sample to the transforming means from the acquiring means ~~inlet; and~~

a mass analyzer housing positioned within the watertight case, the mass analyzer housing in fluid communication with the transforming means;

~~a linear quadrupole mass filter for analyzing the gas phase analyte molecule to determine an identity thereof.~~

a quadrupole mass filter positioned within the mass analyzer housing; and

a vacuum pump system adapted to establish a vacuum within the mass analyzer housing, the vacuum pump system positioned within the watertight case and in fluid communication with the mass analyzer housing.

2. (Currently Amended) The mass spectrometer recited in Claim 1, wherein the transforming means further comprises an introduction probe comprising a membrane having selective transport properties~~, the membrane positioned between the directing means and the analyzing means~~.

3. (Original) The mass spectrometer recited in Claim 2, wherein the membrane has selective transport properties for nonpolar compounds.

4. (Original) The mass spectrometer recited in Claim 3, wherein the membrane comprises polydimethylsiloxane.

5. (Currently Amended) The mass spectrometer recited in Claim ~~3~~ 1, further comprising means for regulating a temperature of the fluid sample along the directing means.

6. (Currently Amended) The mass spectrometer recited in Claim 1, further comprising a first reservoir for holding a control fluid, and wherein the ~~directing means~~ fluid control system comprises a pump having means for selectively directing fluid from the first reservoir to the transforming means.

7. (Original) The mass spectrometer recited in Claim 1, wherein the analyzing means further comprises a computer in electronic communication with the mass filter for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

8. (Cancelled) The mass spectrometer recited in Claim 8, further comprising a housing surrounding the mass filter and a pump for providing a vacuum within the mass filter housing.

9. (Currently Amended) The mass spectrometer recited in Claim 1~~8~~, wherein the pump system comprises a turbo-molecular drag pump and two diaphragm pumps connected in series.

10. (Currently Amended) The mass spectrometer recited in Claim 9, further comprising means for dissipating heat generated by the pump system.

11. (Currently Amended) The mass spectrometer recited in Claim 10, wherein the heat dissipating means comprises a heat sink plate in thermal contact with a heat-conducting material in contact with the watertight case, such that the surrounding aqueous environment affects the heat dissipation.

12. (Cancelled) The mass spectrometer recited in Claim 1, further comprising a means for creating and maintaining a vacuum within the analyzing means in the watertight case.

13. (Currently Amended) The mass spectrometer recited in Claim 1, wherein the watertight case comprises a first and a second watertight cases, the transforming means and the analyzing means residing in the second case, and ~~directing~~ fluid control system ~~means~~ residing in the first case.

14. (Original) The mass spectrometer recited in Claim 1, wherein the transforming means comprises an atmospheric pressure ionization device.

15. (Original) The mass spectrometer in Claim 14, wherein the pressure ionization device comprises an electrospray ionization device.

16. (Currently Amended) The mass spectrometer recited in Claim 134, further comprising a third watertight case, the pump system positioned within the third case.

17. (Currently Amended) A modular, submersible mass spectrometry system comprising a plurality of sealed substantially fluid-tight pressure vessels for operating in an aqueous environment, the system comprising:

a substantially fluid-tight fluidic control pressure vessel containing:

an sample inlet from an aqueous environment and an outlet to an exterior of the fluid control ~~flow injection~~ pressure vessel; and

a fluid control system adapted to acquire a fluid sample from an aqueous environment for delivery into the watertight case, the fluid control system comprising a pump in fluid communication with a control fluid and a sample fluid having a means for selectively pumping the control fluid and the sample fluid to the outlet;

a substantially fluid-tight mass spectrometer pressure vessel containing:

an introduction probe in fluid communication with the fluidic control pressure vessel outlet for transforming an analyte gas molecule present in fluid therefrom comprising a membrane having selective transport properties for nonpolar volatile compounds, the introduction probe for transforming an analyte

gas molecule present in fluid from the fluid control pressure vessel outlet from a ~~solution~~ liquid phase into a gase phase;

a fluid line for establishing fluid communication between the fluidic control pressure vessel outlet and the introduction probe;

a linear quadrupole mass filter in fluid communication with the introduction probe for collecting data on the gas-phase analyte molecule; and

data analysis means for receiving the data collected by the mass filter and performing an analysis thereof to determine an identity of the gas-phase analyte molecule;

a substantially fluid-tight roughing pump pressure vessel containing a vacuum pump system for providing low-pressure conditions in the mass filter; and

a line connecting the vacuum pump with the mass filter.

18. (Original) The system recited in Claim 17, wherein the introduction probe membrane comprises polydimethylsiloxane.

19. (Original) The system recited in Claim 17, further comprising means for regulating a temperature of the fluid pumped to the introduction probe.

20. (Original) The system recited in Claim 17, wherein the data analysis means comprises a computer in electronic communication with the mass filter having software resident thereon for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

21. (Original) The system recited in Claim 17, wherein the vacuum pump comprises two diaphragm pumps connected in series, and further comprising a turbo-molecular drag pump housed within the mass spectrometer vessel and in communication with the line between the two diaphragm pumps and the mass filter.

22. (Original) The system recited in Claim 17, further comprising means for dissipating heat generated by the vacuum pump.

23. (Currently Amended) The system recited in Claim 22, wherein the heat dissipating means comprises a heat sink plate positioned within the roughing pump pressure vessel in thermal contact with a heat-conducting material in contact with the roughing pump pressure vessel~~,~~ such that the surrounding aqueous environment affects the heat dissipation.

24. (Currently Amended) A method for identifying a molecule in an aqueous environment comprising the steps of:

acquiring a fluid sample from an aqueous environment;

delivering the fluid sample into a substantially watertight case, through a sample inlet;

directing ~~a~~ the fluid to a transforming means ~~into a substantially fluid-tight case~~;

transforming an analyte molecule in the fluid from a solution phase into a gas phase within the case; and

analyzing the analyte molecule using a linear quadrupole mass filter to determine an identify thereof.

25. (Original) The method recited in Claim 24, wherein the transforming step comprises using an introduction probe comprising a membrane having selective transport properties for nonpolar volatile compounds.

26. (Original) The method recited in Claim 25, wherein the membrane comprises polydimethylsiloxane.

27. (Original) The method recited in Claim 254, further comprising regulating a temperature of the fluid directed to the introduction probe.

28. (Currently Amended) The method recited in Claim 24, wherein the directing step comprises selectively directing fluid from each of a control fluid source and ~~a~~ the sample fluid source to the transforming means ~~introduction probe~~.

29. (Original) The method recited in Claim 24, wherein the analyzing step further comprises using a computer in electronic communication with the mass filter for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

30. (Original) The method recited in Claim 24, further comprising providing a vacuum within a housing surrounding the mass filter.

31. (Original) The method recited in Claim 30, wherein the pumping step comprises using a turbo-molecular drag pump and two diaphragm pumps connected in series.

32. (Original) The method recited in Claim 24, further comprising dissipating heat-generated by the pump.

33. (Original) The method recited in Claim 32, wherein the heat dissipating step comprises using a heat sink plate in thermal contact with a heat-conducting material in contact with the case.

34. (Currently Amended) A method for making a mass spectrometer adapted for underwater use comprising the steps of:

positioning a means for transforming an analyte molecule from a solution phase into a gas phase within a watertight case having an inlet;

positioning a means for acquiring a fluid sample from an aqueous environment for delivering into a watertight case;

directing ~~a~~ the fluid sample to the transforming means from the acquiring means ~~inlet~~ within the case; ~~and~~

positioning a linear quadrupole mass filter for analyzing the gas-phase analyte molecule to determine an identify thereof within the case; and

surrounding the mass filter with a housing and providing a vacuum within the mass filter housing.

35. (Original) The method recited in Claim 34, wherein the transforming means comprises an introduction probe comprising a membrane having selective transport properties for nonpolar volatile compounds, the membrane positioned between the directing means and the analyzing means.

36. (Original) The method recited in Claim 35, wherein the membrane comprises polydimethylsiloxane.

37. (Original) The method recited in Claim 34, further comprising the step of positioning a means for regulating a temperature of the fluid along the directing means within the case.

38. (Original) The method recited in Claim 34, further comprising the step of positioning a first reservoir for holding a control fluid and a second reservoir for holding waste fluid within the case, and wherein the directing means positioning step comprises affixing a pump having means for selectively directing fluid from the first reservoir to the transforming means within the case.

39. (Currently Amended) The method recited in Claim 3440, further comprising affixing a computer within the case and establishing electronic communication between the computer and the mass filter, the computer for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter

40. (Cancelled) The method recited in Claim 34, further comprising the step of surrounding the mass filter with a housing and providing a vacuum within the mass filter housing.

41. (Currently Amended) The method recited in Claim 3440, further comprising dissipating heat generated within the case.

42. (Currently Amended) A method for making a modular, submersible mass spectrometry system comprising a plurality of sealed, substantially fluid-tight pressure vessels for operating in an aqueous environment, the method comprising the steps of:

positioning within a substantially fluid-tight fluidic control pressure vessel:

an sample inlet from an aqueous environment and an outlet to an exterior of the fluid control flow injection pressure vessel; and

a fluid control system adapted to acquire a fluid sample from an aqueous environment for delivery into the watertight case, the fluid control system comprising a pump in fluid communication with a control fluid and a sample fluid having a means for selectively pumping the control fluid and the sample fluid to the outlet;

positioning within a substantially fluid-tight mass spectrometer pressure vessel:

an introduction probe in fluid communication with the flow injection pressure vessel outlet for transforming a gas molecule present in fluid therefrom comprising a membrane having selective transport properties for nonpolar volatile compounds, the introduction probe for transforming an analyte molecule present in fluid from the fluidic control pressure vessel outlet from a solution liquid phase into a gas phase;

a fluid line for establishing fluid communication between the fluidic control pressure vessel outlet and the introduction probe;

a linear quadrupole mass filter in fluid communication with the introduction probe for collecting data on the gas-phase analyte molecule; and

data analysis means for receiving the data collected by the mass filter and performing an analysis thereof to determine an identity of the gas-phase analyte molecule;

positioning within a substantially fluid-tight pump vessel a vacuum pump for providing low-pressure conditions in the mass filter; and

connecting the vacuum pump with the mass filter.

43. (Original) The method recited in Claim 42, wherein the introduction probe membrane comprises polydimethylsiloxane.

44. (Original) The method recited in Claim 42, further comprising the step of positioning within the fluidic control pressure vessel a means for regulating a temperature of the fluid pumped to the introduction probe.

45. (Original) The method recited in Claim 42, wherein the data analysis means comprises a computer in electronic communication with the mass filter having software resident thereon for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

46. (Original) The method recited in Claim 42, wherein the vacuum pump comprises two diaphragm pumps connected in series, and further comprising the step of positioning a turbo-molecular drag pump within the mass spectrometer vessel and between the two diaphragm pumps and the mass filter.

47. (Original) The method recited in Claim42, further comprising the step of positioning a means for dissipating heat generated by the vacuum pump within the pump vessel.